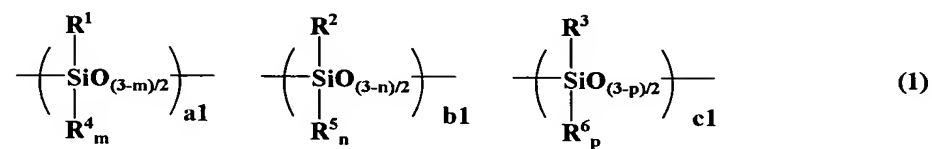


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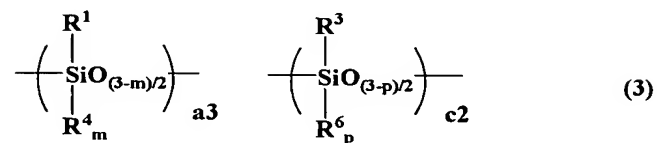
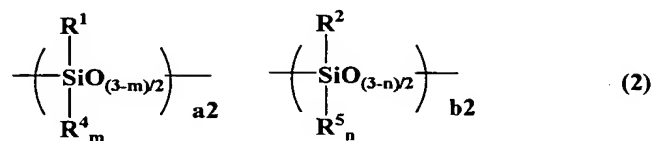
1. An anti-reflection film material used in lithography which contains at least a polymer compound having repeating units for copolymerization represented by the following general formula (1).



(In the formula, R¹ is a monovalent organic group having a crosslink group, R² is a monovalent organic group having a light-absorption group, and R³ is a monovalent organic group which has at least one functional group selected from the group consisting of carbonyl, ester, lactone, amide, ether, and nitrile. a1, b1 and c1 are 0<a1<1, 0<b1<1, 0<c1<1, and 0.5≤a1+b1+c1≤1. Each of R⁴, R⁵ and R⁶ is a hydrogen atom, a hydroxy group, an alkyl group having 1-6 carbon atoms, an aryl group having 6-10 carbon atoms, or a fluorinated alkyl group having 1-6 carbon atoms. Each of m, n and p is 0 or 1.)

2. An anti-reflection film material used in lithography which contains at least a polymer compound having repeating units for copolymerization represented by the following general formula (2) and a polymer compound having

repeating units for copolymerization represented by the following general formula (3).



(In the formula, R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , m , n , and p are as defined above. $a2$ and $b2$ are $0 < a2 < 1$, $0 < b2 < 1$, and $0.5 \leq a2 + b2 \leq 1$. $a3$ and $c2$ are $0 < a3 < 1$, $0 < c2 < 1$, and $0.5 \leq a3 + c2 \leq 1$.)

3. The anti-reflection film material according to Claim 1 which further contains an organic solvent and/or an acid generating agent.

4. The anti-reflection film material according to Claim 2 which further contains an organic solvent and/or an acid generating agent.

5. The anti-reflection film material according to Claim 1 which further contains a crosslinking agent.

6. The anti-reflection film material according to Claim 2 which further contains a crosslinking agent.

7. The anti-reflection film material according to Claim 1 wherein the light-absorption group in the repeating unit of the polymer compound contained in the anti-reflection film material is an aromatic group or a group having a Si-Si bond.

8. The anti-reflection film material according to Claim 2 wherein the light-absorption group in the repeating unit of the polymer compound contained in the anti-reflection film material is an aromatic group or a group having a Si-Si bond.

9. A substrate which has at least an anti-reflection film obtained by baking the anti-reflection film material according to Claim 1 on the substrate.

10. A substrate which has at least an anti-reflection film obtained by baking the anti-reflection film material according to Claim 2 on the substrate.

11. A method for forming a pattern on a substrate by lithography comprising at least applying to the substrate an anti-reflection film material according to Claim 1 and baking the anti-reflection film material to form an anti-

reflection film, applying to the anti-reflection film a photoresist film material and pre-baking the photoresist film material to form a photoresist film, exposing a pattern circuit range of the photoresist film, developing with a developer to form a resist pattern on the photoresist film, and etching the anti-reflection film and the substrate with using as a mask the photoresist film on which the resist pattern is formed to form a pattern on the substrate.

12. A method for forming a pattern on a substrate by lithography comprising at least applying to the substrate an anti-reflection film material according to Claim 2 and baking the anti-reflection film material to form an anti-reflection film, applying to the anti-reflection film a photoresist film material and pre-baking the photoresist film material to form a photoresist film, exposing a pattern circuit range of the photoresist film, developing with a developer to form a resist pattern on the photoresist film, and etching the anti-reflection film and the substrate with using as a mask the photoresist film on which the resist pattern is formed to form a pattern on the substrate.

13. A method for forming a pattern on a substrate by lithography comprising at least applying to the substrate an anti-reflection film

material according to Claim 1 and baking the anti-reflection film material to form an anti-reflection film, applying to the anti-reflection film a photoresist film material and pre-baking the photoresist film material to form a photoresist film, exposing a pattern circuit range of the photoresist film, developing with a developer to form a resist pattern on the photoresist film, etching the anti-reflection film with using as a mask the photoresist film on which the resist pattern is formed, and etching the substrate with using as a mask the anti-reflection film on which the pattern is formed, to form a pattern on the substrate.

14. A method for forming a pattern on a substrate by lithography comprising at least applying to the substrate an anti-reflection film material according to Claim 2 and baking the anti-reflection film material to form an anti-reflection film, applying to the anti-reflection film a photoresist film material and pre-baking the photoresist film material to form a photoresist film, exposing a pattern circuit range of the photoresist film, developing with a developer to form a resist pattern on the photoresist film, etching the anti-reflection film with using as a mask the photoresist film on which the resist pattern is formed, and etching the substrate with using as a mask the anti-reflection

film on which the pattern is formed, to form a pattern on the substrate.

15. A method for forming a pattern on a substrate by lithography comprising at least, forming an organic film on the substrate, applying to the organic film the anti-reflection film material of Claim 1 and baking the anti-reflection film material to form an anti-reflection film, applying a photoresist film material to the anti-reflection film and pre-baking the photoresist film material to form a photoresist film, exposing a pattern circuit range of the photoresist film, developing with a developer to form a resist pattern on the photoresist film, etching the anti-reflection film using as a mask the photoresist film on which the resist pattern is formed, etching the organic film using as a mask the anti-reflection film on which the pattern is formed, and etching the substrate to form a pattern on the substrate.

16. A method for forming a pattern on a substrate by lithography comprising at least, forming an organic film on the substrate, applying to the organic film the anti-reflection film material of Claim 2 and baking the anti-reflection film material to form an anti-reflection film, applying a photoresist film material to the anti-reflection film and pre-baking the photoresist

film material to form a photoresist film, exposing a pattern circuit range of the photoresist film, developing with a developer to form a resist pattern on the photoresist film, etching the anti-reflection film using as a mask the photoresist film on which the resist pattern is formed, etching the organic film using as a mask the anti-reflection film on which the pattern is formed, and etching the substrate to form a pattern on the substrate.